IN THE CLAIMS

This version and listing of the claims replaces and supercedes all prior versions and listings of the claims.

1-3 (Cancelled)

4. (Currently Amended) ~~The wireless communication system according to claim 3, wherein~~ A wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, wherein:

the wireless communication apparatus comprising:

correspondence determining means for determining, upon producing first through M-th (M being an integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels so that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence,

the correspondence determining means comprises:

a transmitting portion including coded sequence producing means for encoding first through K-th transmission sequences to produce first through K-th coded sequences, respectively, interleaved sequence producing means for interleaving the first through the K-th coded sequences to produce first through K-th interleaved sequences, respectively, partial transmission sequence producing means for dividing each of the first through the K-th interleaved sequences into first through M-th partial transmission sequences, transmission signal producing

means for frequency-multiplexing the first through the M-th partial transmission sequences corresponding to each of the first through the K-th transmission sequences with respect to each of the first through the M-th partial transmission sequences to produce first through M-th transmission signals, and first through M-th transmission antennas for transmitting the first through the M-th transmission signals, respectively,

the transmitting portion comprises:

scheduling means for reducing the number of transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of transmission sequences when the reception quality is higher than a predetermined second threshold; and

extracting and combining means for extracting and combining, upon producing first through K-th demodulated sequences, M demodulated signals corresponding to the first through the K-th transmission sequences in accordance with the correspondence between the first through the K-th transmission sequences and the frequency channels,

the extracting and combining means comprises:

a receiving portion including first through N-th (N being an integer not smaller than 1) reception antennas, demodulating means for decomposing first through N-th reception signals received by the first through the N-th reception antennas into first through M-th partial demodulated signals for each frequency channel,

demodulated sequence producing means for extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M

demodulated signals corresponding to each of the first through the K-th transmission sequences to thereby produce first through K-th demodulated sequences, deinterleaved sequence producing means for deinterleaving the first through the K-th demodulated sequences to produce first through K-th deinterleaved sequences, respectively, and decoding means for decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences, respectively.

5. (Original) The wireless communication system according to claim 4, wherein the scheduling means reduces the number of transmission sequences successively from the transmission sequence for which the reception quality at the receiving portion for each transmission sequence is low.

6. (Currently Amended) ~~The wireless communication system according to claim 3, wherein~~ A wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, wherein:

the wireless communication apparatus comprising:

correspondence determining means for determining, upon producing first through M-th (M being an integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels so that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence,

the correspondence determining means comprises:

a transmitting portion including coded sequence producing means for encoding first through K-th transmission sequences to produce first through K-th coded sequences, respectively, interleaved sequence producing means for interleaving the first through the K-th coded sequences to produce first through K-th interleaved sequences, respectively, partial transmission sequence producing means for dividing each of the first through the K-th interleaved sequences into first through M-th partial transmission sequences, transmission signal producing means for frequency-multiplexing the first through the M-th partial transmission sequences corresponding to each of the first through the K-th transmission sequences with respect to each of the first through the M-th partial transmission sequences to produce first through M-th transmission signals, and first through M-th transmission antennas for transmitting the first through the M-th transmission signals, respectively,

the transmitting portion comprises:

scheduling means for reducing the number of frequency channels assigned to the transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of frequency channels assigned to the transmission sequences when the reception quality is higher than a predetermined second threshold; and

extracting and combining means for extracting and combining, upon producing first through K-th demodulated sequences, M demodulated signals corresponding to the first through the K-th transmission sequences in accordance with the correspondence between the first through

the K-th transmission sequences and the frequency channels,

the extracting and combining means comprises:

a receiving portion including first through N-th (N being an integer not smaller than 1) reception antennas, demodulating means for decomposing first through N-th reception signals received by the first through the N-th reception antennas into first through M-th partial demodulated signals for each frequency channel, demodulated sequence producing means for extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M demodulated signals corresponding to each of the first through the K-th transmission sequences to thereby produce first through K-th demodulated sequences, deinterleaved sequence producing means for deinterleaving the first through the K-th demodulated sequences to produce first through K-th deinterleaved sequences, respectively, and decoding means for decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences, respectively.

7. (Currently Amended) ~~The wireless communication system according to claim 3, wherein~~ A wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, wherein:

the wireless communication apparatus comprising:

correspondence determining means for determining, upon producing first through M-th (M being an integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency

channels so that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence,

the correspondence determining means comprises:

a transmitting portion including coded sequence producing means for encoding first through K-th transmission sequences to produce first through K-th coded sequences, respectively, interleaved sequence producing means for interleaving the first through the K-th coded sequences to produce first through K-th interleaved sequences, respectively, partial transmission sequence producing means for dividing each of the first through the K-th interleaved sequences into first through M-th partial transmission sequences, transmission signal producing means for frequency-multiplexing the first through the M-th partial transmission sequences corresponding to each of the first through the K-th transmission sequences with respect to each of the first through the M-th partial transmission sequences to produce first through M-th transmission signals, and first through M-th transmission antennas for transmitting the first through the M-th transmission signals, respectively,

the transmitting portion comprises:

scheduling means for reducing the number of frequency channels assigned to the transmission sequence for which a reception quality at the receiving portion for each transmission sequence is lower than a predetermined first threshold and for increasing the number of frequency channels assigned to the transmission sequence for which the reception quality is higher than a predetermined second

threshold; and

extracting and combining means for extracting and combining, upon producing first through K-th demodulated sequences, M demodulated signals corresponding to the first through the K-th transmission sequences in accordance with the correspondence between the first through the K-th transmission sequences and the frequency channels,

the extracting and combining means comprises:

a receiving portion including first through N-th (N being an integer not smaller than 1) reception antennas, demodulating means for decomposing first through N-th reception signals received by the first through the N-th reception antennas into first through M-th partial demodulated signals for each frequency channel, demodulated sequence producing means for extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M demodulated signals corresponding to each of the first through the K-th transmission sequences to thereby produce first through K-th demodulated sequences, deinterleaved sequence producing means for deinterleaving the first through the K-th demodulated sequences to produce first through K-th deinterleaved sequences, respectively, and decoding means for decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences, respectively.

8. (Currently Amended) ~~The wireless communication system according to claim 3, wherein~~ A wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, wherein:

the wireless communication apparatus comprising:

correspondence determining means for determining, upon producing first through M-th (M being an integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels so that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence,

the correspondence determining means comprises:

a transmitting portion including coded sequence producing means for encoding first through K-th transmission sequences to produce first through K-th coded sequences, respectively, interleaved sequence producing means for interleaving the first through the K-th coded sequences to produce first through K-th interleaved sequences, respectively, partial transmission sequence producing means for dividing each of the first through the K-th interleaved sequences into first through M-th partial transmission sequences, transmission signal producing means for frequency-multiplexing the first through the M-th partial transmission sequences corresponding to each of the first through the K-th transmission sequences with respect to each of the first through the M-th partial transmission sequences to produce first through M-th transmission signals, and first through M-th transmission antennas for transmitting the first through the M-th transmission signals, respectively,

the transmitting portion comprises:

scheduling means for reducing the number of transmission antennas assigned to the transmission sequences when a reception

quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of transmission antennas assigned to transmission sequences when the reception quality is higher than a predetermined second threshold; and

extracting and combining means for extracting and combining, upon producing first through K-th demodulated sequences, M demodulated signals corresponding to the first through the K-th transmission sequences in accordance with the correspondence between the first through the K-th transmission sequences and the frequency channels,

the extracting and combining means comprises:

a receiving portion including first through N-th (N being an integer not smaller than 1) reception antennas, demodulating means for decomposing first through N-th reception signals received by the first through the N-th reception antennas into first through M-th partial demodulated signals for each frequency channel, demodulated sequence producing means for extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M demodulated signals corresponding to each of the first through the K-th transmission sequences to thereby produce first through K-th demodulated sequences, deinterleaved sequence producing means for deinterleaving the first through the K-th demodulated sequences to produce first through K-th deinterleaved sequences, respectively, and decoding means for decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences, respectively.

9. (Currently Amended) ~~The wireless communication system according to claim 3, wherein~~ A wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, wherein:

the wireless communication apparatus comprising:

correspondence determining means for determining, upon producing first through M-th (M being an integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels so that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence,

the correspondence determining means comprises:

a transmitting portion including coded sequence producing means for encoding first through K-th transmission sequences to produce first through K-th coded sequences, respectively, interleaved sequence producing means for interleaving the first through the K-th coded sequences to produce first through K-th interleaved sequences, respectively, partial transmission sequence producing means for dividing each of the first through the K-th interleaved sequences into first through M-th partial transmission sequences, transmission signal producing means for frequency-multiplexing the first through the M-th partial transmission sequences corresponding to each of the first through the K-th transmission sequences with respect to each of the first through the M-th partial transmission sequences to produce first through M-th transmission signals, and first through M-th transmission antennas for transmitting the first through the M-th transmission signals, respectively,

the transmitting portion comprises:

scheduling means for reducing the number of transmission antennas assigned to the transmission sequence for which a reception quality at the receiving portion for each transmission sequence is lower than a predetermined first threshold and for increasing the number of transmission antennas assigned to the transmission sequence for which the reception quality is higher than a predetermined second threshold; and

extracting and combining means for extracting and combining, upon producing first through K-th demodulated sequences, M demodulated signals corresponding to the first through the K-th transmission sequences in accordance with the correspondence between the first through the K-th transmission sequences and the frequency channels,

the extracting and combining means comprises:

a receiving portion including first through N-th (N being an integer not smaller than 1) reception antennas, demodulating means for decomposing first through N-th reception signals received by the first through the N-th reception antennas into first through M-th partial demodulated signals for each frequency channel, demodulated sequence producing means for extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M demodulated signals corresponding to each of the first through the K-th transmission sequences to thereby produce first through K-th demodulated sequences, deinterleaved sequence producing means for deinterleaving the first through the K-th demodulated sequences to produce first through K-th

deinterleaved sequences, respectively, and decoding means for decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences, respectively.

10. (Currently Amended) The wireless communication system according to claim [[1]]4, wherein OFDM (Orthogonal Frequency Division Multiplex) is used as a wireless transmission method and frequency multiplexing is realized by multiplexing subcarriers.

11. (Currently Amended) The wireless communication system according to claim [[1]]4,wherein:

the transmission signal producing means determines, upon producing the first through the M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency hopping pattern for each of said plurality of transmission antennas, where each transmission signal output has a different frequency hopping pattern;

the demodulated sequence producing means extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal output.

12. (Original) The wireless communication system according to claim 11, wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i = 1, 2, ..., K) transmission sequence are completely orthogonal among the first through the M-th transmission

signals.

13-37 (Cancelled)

38. (New) The wireless communication system according to claim 6, wherein OFDM (Orthogonal Frequency Division Multiplex) is used as a wireless transmission method and frequency multiplexing is realized by multiplexing subcarriers.

39. (New) The wireless communication system according to claim 6, wherein:

the transmission signal producing means determines, upon producing the first through the M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency hopping pattern for each of said plurality of transmission antennas, where each transmission signal output has a different frequency hopping pattern;

the demodulated sequence producing means extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal output.

40. (New) The wireless communication system according to claim 39, wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i = 1, 2, ..., K) transmission sequence are completely orthogonal among the first through the M-th transmission signals.

41. (New) The wireless communication system according to claim 7, wherein OFDM (Orthogonal Frequency Division Multiplex) is used as a wireless transmission method and frequency multiplexing is realized by multiplexing subcarriers.

42. (New) The wireless communication system according to claim 7, wherein:

the transmission signal producing means determines, upon producing the first through the M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency hopping pattern for each of said plurality of transmission antennas, where each transmission signal output has a different frequency hopping pattern;

the demodulated sequence producing means extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal output.

43. (New) The wireless communication system according to claim 42, wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i = 1, 2, ..., K) transmission sequence are completely orthogonal among the first through the M-th transmission signals.

44. (New) The wireless communication system according to claim 8, wherein OFDM (Orthogonal Frequency Division Multiplex) is used as a wireless transmission method and frequency multiplexing is realized by multiplexing subcarriers.

45. (New) The wireless communication system according to claim 8, wherein:

the transmission signal producing means determines, upon producing the first through the M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency hopping pattern for each of said plurality of transmission antennas, where each transmission signal output has a different frequency hopping pattern;

the demodulated sequence producing means extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal output.

46. (New) The wireless communication system according to claim 45, wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i = 1, 2, ..., K) transmission sequence are completely orthogonal among the first through the M-th transmission signals.

47. (New) The wireless communication system according to claim 9, wherein OFDM (Orthogonal Frequency Division Multiplex) is used as a wireless transmission method and frequency multiplexing is realized by multiplexing subcarriers.

48. (New) The wireless communication system according to claim 9, wherein:

the transmission signal producing means determines, upon producing the first through the

M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency hopping pattern for each of said plurality of transmission antennas, where each transmission signal output has a different frequency hopping pattern;

the demodulated sequence producing means extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal output.

49. (New) The wireless communication system according to claim 48, wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i = 1, 2, ..., K) transmission sequence are completely orthogonal among the first through the M-th transmission signals.